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[March 2017]

## Memories in Mud: The Environmental Legacy of the Great War

Frank Uekötter

On August 3, 2014, the presidents of France and Germany, François Hollande and Joachim Gauck, met for a commemorative event to mark the centennial of the Great War. The place of choice was the Hartmannswillerkopf mountain in Alsace. The trenches of the First World War ran over this mountain, as German and French soldiers were facing and fighting each other over four years. Some 30,000 men perished on the Hartmannswillerkopf, but neither side had made significant gains by the end of the war. A hundred years later, visitors can still look at 60 kilometers of trenches, 600 bunkers, and a French war cemetery, soon to be joined by a museum; the presidents laid the foundation stone during their visit. About 200,000 people come every year to see a mountain that the French called a “man-eater” (*mangeur d’hommes*). For two countries that cherish rituals of consolation, it seems like a good place for commemoration along the familiar themes of Franco-German post-war *amitié*, and given that acts of state are carefully scripted events nowadays, it should come as no surprise that everything went according to plan. Yet nature could have interfered with the ceremony in its own distinct ways. Visitors to the Hartmannswillerkopf are warned to watch out for a local population of *vipera berus*, better known as the common European adder.<sup>1</sup>

On first glance, the risk of snakebites might seem as remote as the role of the environment in the commemoration of World War One. In his book *The Long Shadow: The Great War and the Twentieth Century*, David Reynolds looks into a wide range of issues from automobile production and consumer debt to pastoralism in art and poetry, but environmental issues receive short shrift.<sup>2</sup> When it comes to war, the human element is usually front and center, and the environment appears as a side issue at best and a distraction at worst. But in a way, the adders at the Franco-German summit serve as a fitting metaphor for the search for environmental memories.

This epilogue argues for a broader approach to the environmental legacy of war. Scholars have long recognized that visions of nature played a role in the experience of war. George Mosse argued that war “led to a heightened awareness of nature”, as mythical landscapes

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<sup>1</sup> <http://www.faz.net/aktuell/gesellschaft/der-menschenfresserberg-zehntausende-starben-am-hartmannswillerkopf-12689001.html> and <https://www.tagesschau.de/inland/weltkrieg-gedenken-104.html> (retrieved March 21, 2017).

<sup>2</sup> David Reynolds, *The Long Shadow: The Great War and the Twentieth Century* (London: Simon & Schuster, 2013).

helped “to mask the reality of war”.<sup>3</sup> Imaginations of the land also served as a bridge between memory studies and environmental history in Simon Schama’s widely acclaimed *Landscape and Memory*.<sup>4</sup> The interplay between landscapes and memory is an important focal point in recent scholarship on war and the environment, and yet it seems that this approach does not exhaust the topic.<sup>5</sup> More precisely, discussions of militarized landscapes tend to remain on the surface in quite a literal sense, but the impact of animals, plants, and materials goes much deeper. If we want to capture these impacts in their full complexity, we need a more encompassing methodological approach: while focusing on landscapes tends to view the environment first and foremost as a *reflection* of memories, we should see it more broadly as a *distinct mode* of memory.<sup>6</sup> Bringing the environment more fully into memory studies forces us to take first-hand experiences with the natural world more seriously in memory studies, and it alerts us to the co-evolution of human memories and the natural world. As it stands, memory studies rest firmly with the province of cultural studies, but we cannot grasp the full environmental legacy of the Great War if we remain committed to this academic tradition.

The natural environment is inherently transnational, and this deserves particular attention in the present context. The nation-state has figured prominently in memory studies ever since Pierre Nora’s landmark project on French *lieux de mémoire*.<sup>7</sup> In recent years, scholars have begun to seek venues to advance the debate across borders. An international group of scholars has published a compilation of European sites of memory in three volumes.<sup>8</sup> Another group produced no less than five volumes on sites of memory that Germany and Poland share.<sup>9</sup> And then there is what Klaus Bachmann has labeled “Versöhnungskitsch”: well-meaning but overtly pathetic mementos of consolation.<sup>10</sup> The following discussion is not beyond national

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<sup>3</sup> George L. Mosse, *Fallen Soldiers: Reshaping the Memory of the World Wars* (New York: Oxford University Press, 1990), p. 107

<sup>4</sup> Simon Schama, *Landscape and Memory* (London: Happer Perennial, 1995).

<sup>5</sup> For some recent contributions see Brian Black, "The Nature of Preservation: The Rise of Authenticity at Gettysburg," *Civil War History* 58 (2012), pp. 348-373; Chris Pearson, *Mobilizing Nature: The Environmental History of War and Militarization in Modern France* (Manchester: Manchester University Press, 2012); Chris Pearson, Peter Coates, Tim Cole (eds.), *Militarized Landscapes: From Gettysburg to Salisbury Plain* (London: Continuum, 2010).

<sup>6</sup> Cf. Patrick Joyce, Tony Bennett (eds.), *Material Powers. Cultural Studies, History and the Material Turn* (Abingdon: Routledge, 2010).

<sup>7</sup> Pierre Nora, *Les lieux de mémoire*, 7 Vol., Gallimard, Paris 1984-92.

<sup>8</sup> Pim den Boer et al. (eds.), *Europäische Erinnerungsorte* (3 vol., Munich: Oldenbourg, 2012).

<sup>9</sup> Hans Henning Hahn, Robert Traba (eds.), *Deutsch-polnische Erinnerungsorte. Vol. 1: Geteilt/Gemeinsam* (Paderborn: Schöningh, 2015); Hans Henning Hahn, Robert Traba (eds.), *Deutsch-polnische Erinnerungsorte. Vol. 2: Geteilt/Gemeinsam* (Paderborn: Schöningh, 2014); Hans Henning Hahn, Robert Traba (eds.), *Deutsch-polnische Erinnerungsorte. Vol. 3: Parallelen* (Paderborn: Schöningh, 2012); Hans Henning Hahn, Robert Traba (eds.), *Deutsch-polnische Erinnerungsorte. Vol. 4: Reflexionen* (Paderborn: Schöningh, 2013); Peter Oliver Loew, Robert Traba (eds.), *Deutsch-polnische Erinnerungsorte. Vol. 5: Erinnerung auf Polnisch* (Paderborn: Schöningh, 2015).

<sup>10</sup> Cf. Hans Henning Hahn, Heidi Hein-Kircher, Anna Kochanowska-Nieborak (eds.), *Erinnerungskultur und Versöhnungskitsch* (Marburg: Herder-Institut, 2008).

contexts, and yet it deserves reflection that many environmental experiences transcend national borders by their very nature: forests, crops, and weeds have taken over former battlefields wherever they are. In fact, given that so much of World War One commemoration remains captive of national frames of reference, it may help to reflect on experiences that move beyond these contexts. Scholarship by environmental historians has long displayed a power to subvert conventional readings. The centennial of World War One is as good an occasion as any to bring this to bear in memory studies.

## **Landscapes of War**

The Hartmannswillerkopf mountain is one of numerous battlefields that entered collective memory. The Great War bestowed Europe with a new mental geography, and some places became famous (or infamous) far and wide. Some sites, such as Passchendaele and Gallipoli, were virtually unknown before they became places of mass death. Others already had a place in history that was all but erased by the war: the Verdun article in Pierre Nora's seminal volumes devotes only few cursory sentences to the 843 Treaty of Verdun and Vauban's 17<sup>th</sup> century fortifications, suggesting that claims about long-standing national fame are a post-1916 glorification: "For the pedagogues of the late nineteenth century, Verdun was no different from many other cities."<sup>11</sup> In the case of the 1914 Tannenberg battle, war propaganda could nicely link the German victory to a previous battle of 1410, all the more since that battle had ended with a fateful defeat of the Teutonic Order of Knights (a reading that generously glanced over the fact that the two medieval armies were multiethnic).<sup>12</sup> In 1927, the German president Paul von Hindenburg, formerly commander of the German military during World War One, attended the inaugural of the Tannenburg National Memorial and gave a speech that exonerated Germany from blame for the war. The League of Nations, in session at Geneva at the time, was not amused.<sup>13</sup>

Battles left their mark on the land, particularly where the frontlines were stalled and armies dug into the ground. Trenches obviously changed the landscape, but they were only the most spectacular feature of a complex technological system. As David Stevenson writes, "In their way the trenches were an imposing engineering achievement, the more so if account is taken

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<sup>11</sup> Antoine Prost, "Verdun," Pierre Nora, Lawrence D. Kritzman (ed.), *Realms of Memory: The Construction of the French Past. Volume III: Symbols* (New York: Columbia University Press, 1998), pp. 377-401; p. 379.

<sup>12</sup> Frithjof Benjamin Schenk, "Tannenberg/ Grunwald," Etienne François, Hagen Schulze (eds.), *Deutsche Erinnerungsorte. Vol. 1* (Munich: C.H. Beck, 2001), pp. 438-454.

<sup>13</sup> Anton Gill, *A Dance Between Flames: Berlin Between the Wars* (London: Abacus, 1995), p. 166.

of the immense infrastructure behind them. It comprised hospitals, barracks, training camps, ammunition dumps, artillery parks, and telephone networks, as well as military roads and canals, but pre-eminently it meant railways.”<sup>14</sup> Scientists have studied the former battlefields as exemplary cases of anthropogenic disturbances of the soil and found that “the millions of artillery craters on the Verdun battlefield have changed the area’s surface hydrology, water table characteristics, and soil development processes and rates.”<sup>15</sup> However, trench warfare left its technological mark far beyond the range of the artillery. The railroad bridge at Remagen, which became famous in the Second World War as the only bridge over the Rhine that the retreating German army failed to destroy, was hastily built during the First World War. Gerard Fitzgerald’s discussion of the Superfund site that grew out of the production of poison gas in Edgewood, Maryland shows that the impact on the land even extended beyond the Atlantic.

War created new landscapes, but it also erased existing ones. The university library at Leuven, Belgium became an infamous symbol of German militarism after the advancing German army put it to flames. (The library was rebuilt in the 1920s, reconstructed again after another conflagration that another German army induced in 1940, and eventually became a permanent victim to the university’s separation into a French and a Flemish wing in 1971.)<sup>16</sup> The Montello forest in the Italian province of Treviso, carefully protected against local intrusions by Venetian authorities that craved its oaks and chestnut trees for shipbuilding, was ravaged during World War One.<sup>17</sup> When the heads of state of the European Union assembled for a summit in June 2014, they had dinner in the cloth hall of Ypres, a reconstructed copy of a medieval building that, along with the rest of the historic city, had been leveled in the Battles of Ypres. The Belgian residents had rebuild their town in the 1920s over objections from none other than Winston Churchill, who wanted to keep the town in its ruined state as a testimonial to British wartime sacrifice.<sup>18</sup>

Commemorative tourism is not a privilege of the elite, however, and has never been. The first Michelin guides on the battle zone went to press while the fighting was still in progress. After the armistice, Frenchmen received free railroad trips to war cemeteries while Thomas

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<sup>14</sup> David Stevenson, *1914-1918: The History of the First World War* (London: Penguin, 2004), p. 182.

<sup>15</sup> Joseph P. Hupy, Randall J. Schaetzl, "Soil Development on the WWI Battlefield of Verdun, France," *Geoderma* 145 (2008), pp. 37-49; p. 47.

<sup>16</sup> Wolfgang Schivelbusch, *Die Bibliothek von Löwen: Eine Episode aus der Zeit der Weltkriege* (Munich: Hanser, 1988).

<sup>17</sup> Ulrich Gruber, *Die Entdeckung der Nachhaltigkeit: Kulturgeschichte eines Begriffs* (Munich: Kunstmann, 2010), p. 86.

<sup>18</sup> David William Lloyd, *Battlefield Tourism: Pilgrimage and the Commemoration of the Great War in Britain, Australia and Canada, 1919-1939* (London: Bloomsbury Academic, 1998), p. 121.

Cook offered packaged trips.<sup>19</sup> The leftovers of the war even became the subject of a distinct branch of archaeology in recent decades.<sup>20</sup> It may be a good idea to have specialists doing the digging, as there is an enduring risk from unexploded ammunition. The people in the Flemish town of Messines know that particularly well.

The Battle of Messines began with a thundering explosion on June 7, 1917. British tunnelers had dug shafts under the German lines, filled them with explosives, and ignited them simultaneously. Nineteen mines exploded and destroyed the German lines, which allowed the British Second Army to capture the Messines-Wytschaete Ridge; one explosion at Spanbroekmolen left a crater 430 feet in diameter. However, two mines failed to explode. "One of them was deliberately detonated in 1955, the other remains underground somewhere to the north-east of Ploegsteert Wood, its exact position unknown", Martin Gilbert wrote, adding that the presence was "exciting periodic local nervousness".<sup>21</sup> That sentiment is arguably unsurprising, as the Spanbroekmolen mine crater is still around under a new name. It now figures as "The Pool of Peace".<sup>22</sup>

Underground explosions were also a weapon of choice in the war between Italy and the Austro-Hungarian Empire. After Italy joined the war in 1915, the front line ran across the Southern Alps, which made sudden advances even more difficult than along the Western front. It was quite an achievement to establish and maintain an artillery positions at an altitude of 3,860 meters, as the Austrians did on the Ortler massif, and losses ran high due to the environmental conditions. However, all these efforts could also be read as superlative examples of alpinism. There were many volunteers on the Austrian-German side, particularly during the early stages of war when most regular soldiers were fighting elsewhere. It became a distinct chapter of remembrance after the war. A vast literature discussed the alpine war as if it had been something of a mountain climbing contest under peculiar conditions. Even recent travel book writers are torn between the horrors of trench war and admiration for the mountaineers' superb skills.<sup>23</sup>

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<sup>19</sup> Susanne Brandt, "Reklamefahrten zur Hölle oder Pilgerreisen? Schlachtfeldtourismus zur Westfront von 1914 bis heute," *Tourismus Journal* 7:1 (2003), pp. 107-124; p. 111n.

<sup>20</sup> Yannick Van Hollebeeke, Birger Stichelbaut, Jean Bourgeois, "From Landscape of War to Archaeological Report: Ten Years of Professional World War I Archaeology in Flanders (Belgium)," *European Journal of Archaeology* 17:4 (2014), pp. 702-719.

<sup>21</sup> Martin Gilbert, *First World War* (London: Weidenfeld and Nicolson, 1994), p. 336. The mine has not exploded to the present day (<http://www.wwi1battlefields.co.uk/flanders/messines.html> [retrieved March 21, 2017]).

<sup>22</sup> <http://echoesofwar.blogspot.co.uk/2009/01/mud-corner-cwgc.html> (retrieved March 21, 2017).

<sup>23</sup> Dietrich Höllhuber, *Südtirol* (2nd edition, Erlangen: Michael Müller Verlag, 2006), p. 414; Oswald Stimpfl et al., *Südtirol* (8th edition, Ostfildern: Karl Baedeker Verlag, 2006), p. 34.

## Mudlands

The battlefields are more than simple relics of war. They were also places of targeted design. Most of the Western front came under French control after the war, and so it was particularly important that France passed a law in 1920 that allowed the government to specify certain bunkers, craters, or trenches for protection. After one year, 236 sites were listed.<sup>24</sup> However, the appearance of the land quickly became more of a human creation as soon as nature found an opportunity to intervene with its own dynamism. Reforestation at Verdun became subject to a vigorous debate in the veterans' journal *Le Journal des mutilés et réformés* in 1930.<sup>25</sup> Overgrowth was an important issue for visitors, as veterans sought to recognize their former positions and reacted with furor to changes in familiar views. And overgrowth was a metaphorical problem, as it seemed to reflect a fateful fading of collective awareness.

Of course, its appearance is only one part of the experience of a landscape, if one wishes to use the word at all; Dorothee Brantz has argued that the Great War "unsettled existing notions of landscape" to such an extent that one should rather speak of "environments".<sup>26</sup> Most soldiers viewed the battlefield from low-lying positions, through barbed wire and small openings in fortified positions. In fact, many soldiers watched the landscape in a state of dissolution, as mines and artillery combined with rainfall and groundwater to turn the ground into a sodden state. Mud was perhaps the most notorious environmental icon of the war, and it continues to hold a certain fascination. Some historians (including the present one) could not resist the temptation of referring to mud in their titles.<sup>27</sup>

Mud was dangerous for a number of reasons. It jeopardized the technological infrastructure that the war rested upon. Loose ground destabilized fortifications, gummed up guns and ammunition, and a mudslide could distract attention at a crucial moment. It exacerbated the unsanitary conditions in the trenches. Mud could also spread diseases: "The fertile fields of the Flanders plain, heavily manured in peacetime, harboured many highly infectious organisms such as *Clostridium Tetani*, the cause of gas gangrene. ... Tissue loss, infection and

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<sup>24</sup> Brandt, "Reklamefahrten," p. 113.

<sup>25</sup> Prost, "Verdun," p. 389.

<sup>26</sup> Dorothee Brantz, "Environments of Death: Trench Warfare on the Western Front, 1914-18," Charles Closmann (ed.), *War and the Environment. Military Destruction in the Modern Age* (College Station: Texas A&M University Press, 2009), pp. 68-91; p. 83.

<sup>27</sup> See, for instance, Gordon Corrigan, *Mud, Blood and Poppycock: Britain and the First World War* (London: Cassell, 2003), E.P.F. Lynch, *Somme Mud: The War Experiences of an Infantryman in France 1916-1919* (Milsons Point, NSW: Random House Australia, 2006), and Marianne Barker, *Nightingales in the Mud: The Digger Sisters of the Great War, 1914-1918* (Sydney: Allen & Unwin, 1989).

scarring combined to produce dreadful deformity in those who survived.”<sup>28</sup> The mud even brought forth a new type of disease called “trench foot” with symptoms “similar to frostbite caused by constant immersion”.<sup>29</sup>

Contrary to a popular myth, mud was not universal. Sometimes a helpful geology kept the soldiers’ feet dry, and even Flanders had extended periods without rain. But where it was present, mud was a terrifying force in its own right. On March 26, 1917, a French front-line newspaper described it as follows:

“At night, crouching in a shell-hole and filling it, the mud watches, like an enormous octopus. The victim arrives. It throws its poisonous slobber out at him, blinds him, closes round him, buries him. One more ‘*disparu*’, one more man gone.... For men die of mud, as they die from bullets, but more horribly. Mud is where men sink and – what is worse – where their soul sinks. But where are those hack journalists who turn out such heroic articles, when the mud is that deep? Mud hides the stripes of rank, there are only poor suffering beasts. Look, there, there are flecks of red on that pool of mud – blood from a wounded man. Hell is not fire, that would not be the ultimate in suffering. Hell is mud!”<sup>30</sup>

The mud eroded not only soldiers’ morale but also the customs of civilized society. Cleanliness was a key part of bourgeois culture, and a stain of mud meant more than a physical blemish in peacetime.<sup>31</sup> But in the trenches, mud was a full-body experience, and there was no escape from its power. In fact, it was probably this symbolic power that made it such an enduring fixture of commemoration. The mud stood for disorder and chaos, the antithesis of Western civilization – in short, the end of the world as people knew it. While literary figures could retrospectively rhapsodize about artillery battles as the “storms of steel” (*Stahlgewitter*) of Jüngerian fame, that never worked with the mud.<sup>32</sup>

## A New Material World

The First World War changed not only landscapes but also the material world. It brought forth new commodities and permanently changed the place of pre-existing ones. The change was particularly dramatic for the Central Powers, which found themselves cut off from world

<sup>28</sup> Andrew Bamji, “Facial Surgery: The Patient’s Experience,” Hugh Cecil, Peter H. Liddle (eds.), *Facing Armageddon: The First World War Experienced* (London: Leo Cooper, 1996), pp. 490-501; p. 492.

<sup>29</sup> Stevenson, 1914-1918, p. 207.

<sup>30</sup> Quoted after Gilbert, *First World War*, p. 313.

<sup>31</sup> Manuel Frey, *Der reinliche Bürger. Entstehung und Verbreitung bürgerlicher Tugenden in Deutschland, 1760-1860* (Göttingen: Vandenhoeck & Ruprecht, 1997).

<sup>32</sup> Cf. Ernst Jünger, *In Stahlgewittern* (Stuttgart: Klett-Cotta, 2014 [originally published 1920]).



markets due to an effective Allied blockade of overseas trade. Finding replacements for products that were no longer available became common sports, and at the end of the war, German ingenuity had produced more than 11,000 ersatz products.<sup>33</sup> One of the enterprising spirits was Konrad Adenauer, later chancellor of the Federal Republic, who administered the food supply of Cologne during the war and won a patent for inventing a nutritious but mediocre tasting bread – good enough to fill the stomach, but not so good as to encourage overconsumption.<sup>34</sup>

Many of these products disappeared with the end of the war, as they were clearly inferior and furthermore evoked unwelcome memories of hard times. Adenauer's bread is still available for purchase in Cologne, though, a worthy precursor to Helmut Kohl's penchant for *Saumagen*, a hearty dish that countless political figures had to stomach in his presence.<sup>35</sup> British publishers even brought the wartime cookbook – a popular genre at the time, as scarcity called for new ways of preparing meals – back to life in time for the centennial.<sup>36</sup> But then, the material consequences of World War One also matter for people who do not care for trench pudding. At least three commodities that defined modernity in the twentieth century came out of the war transformed: oil, aluminum, and synthetic nitrogen.

The First World War was the first military conflict where oil played a defining role (see Dan Tamir's chapter in this volume for details). On the eve of Sarajevo, the First Lord of the Admiralty, Winston Churchill, convinced the British parliament to buy a stake in the Anglo-Persian Oil Company, which offered discounts on navy fuel purchases thereafter. Paris taxicabs brought French troops to the Marne in September 1914. "In the course of the First World War, oil and the internal combustion engine changed every dimension of warfare, even the very meaning of mobility on land and sea and in the air", Daniel Yergin wrote in his highly acclaimed *The Prize*.<sup>37</sup> Global petroleum use increased by 50 percent during the four years of war, a growth rate that provoked the first spate of depletion warnings after the guns fell silent.<sup>38</sup> The post-war jockeying of European and American oil interests in the Middle East was the overture for a century of foreign interventions in the region.

Aluminum is the earth's most abundant metal, but it did not meet the public's eyes until the 1855 Paris World Fair. In 1845, the German chemist Friedrich Wöhler had synthesized the

<sup>33</sup> Ulrich Herbert, *Geschichte Deutschlands im 20. Jahrhundert* (Munich: C.H. Beck, 2014), p. 143.

<sup>34</sup> Peter Koch, *Die Erfindungen des Dr. Konrad Adenauer* (Reinbek: Wunderlich, 1986).

<sup>35</sup> [http://www.koeln.de/koeln/unfertig\\_adenauerbrot\\_428837.html](http://www.koeln.de/koeln/unfertig_adenauerbrot_428837.html) (retrieved March 21, 2017).

<sup>36</sup> May Clarissa Gillington Byron, *The Great War Cook Book* (Stroud: Amberley, 2014); Andrew Robertshaw, *Feeding Tommy: Battlefield Recipes from the First World War* (Stroud, Gloucestershire: Spellmount, 2013).

<sup>37</sup> Daniel Yergin, *The Prize: The Epic Quest for Oil, Money and Power* (New York: Simon & Schuster, 1991), p. 167.

<sup>38</sup> Brian C. Black, *Crude Reality: Petroleum in World History* (Lanham: Rowman & Littlefield, 2012), p. 80.

first drops of aluminum, but it initially was little more than a lab curiosity. Aluminum's specific weight is about one-third that of iron, but that failed to win many converts in the nineteenth century: iron was easier to forge and to weld, and its production took less energy. Germany did not have a single aluminum smelter until World War One inspired a hectic buildup of production capacities, and the global output of aluminum more than doubled (1914-18) from 84,000 tons to 180,000 tons.<sup>39</sup> After the war, aluminum became a solution in search of a problem, but frantic invention of new uses forestalled the commodity's decline. Ever since the Great War, the high-energy metal has been part of modern living

During the war, aluminum was used as an electric conductor and for zeppelin construction (use for winged aviation was still marginal), which makes it difficult to call it a decisive commodity. In that respect, synthetic nitrogen was different: it was the crucial resource that kept the German army firing during the First World War. Fritz Haber and Carl Bosch had mastered the technology of producing ammonia from atmospheric nitrogen shortly before the First World War. Once the fighting had started, the output was earmarked for the production of explosives, replacing saltpeter imports that were no longer available. The advent of synthetic nitrogen changed the global nitrogen cycle forever, and it has rightly been called "one of the great technological achievements of the twentieth century".<sup>40</sup> Haber received the Nobel Prize for Chemistry in 1918, but his reputation was already tainted by another substance at that point – poison gas. Haber was the scientific mastermind behind Germany's chemical warfare.<sup>41</sup>

## **The Panic Button**

The wartime story of synthetic nitrogen has another dimension that deserves reflection in the present context. Fritz Haber had envisioned synthetic nitrogen for use as mineral fertilizer, and his company, the Badische Anilin- und Soda-Fabrik (BASF), had taken steps for an orderly introduction into agriculture. When mass production was starting at the Oppau plant near Ludwigshafen, BASF set up its own agricultural experiment station at Limburgerhof in

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<sup>39</sup> Luitgard Marschall, *Aluminium – Metall der Moderne* (Munich: oekom, 2008), pp. 166, 171.

<sup>40</sup> Hugh S. Gorman, *The Story of N: A Social History of the Nitrogen Cycle and the Challenge of Sustainability* (New Brunswick: Rutgers University Press, 2013), p. 79.

<sup>41</sup> Margit Szöllösi-Janze, *Fritz Haber 1868-1934: Eine Biographie* (Munich: C.H. Beck, 1998).

the Spring of 1914 in order to study the new fertilizer closely in field trials.<sup>42</sup> With the huge expansion of production capacity during the war, vast quantities were suddenly available for farmers once the guns fell silent, and the introduction of synthetic nitrogen occurred in a frenzy. The result was gross misuse and a dangerous soil fertility crisis.<sup>43</sup>

The story illustrates an important point. It mattered not only *that* the First World War changed the material world but also *how change took place*. None of the warring nations had any advance planning for resource management, as statesmen commonly expected a war of short duration. With the front lines stagnant by autumn 1914, countries built war economies with much improvisation and little thought about long-term consequences. Environmental problems were rooted in their material essence as much as in speed, and the tumultuous post-war years did not help things to calm down quickly. It was as if entire societies had pressed the panic button.

With that in mind, one of the most exciting questions about the environmental legacy of World War One is whether we can observe a general shift in the style of environmental management in the wake of the war experience. The brutalizing effect of total war is a familiar theme in general history, but it is still an open question whether it left an imprint on environmental issues. When a neighbor complained about noise from a factory in Erfurt in 1916, company officials retorted that the nuisance, which stemmed from trial runs for aircraft engines, was nothing compared with “artillery barrage at Verdun (*Trommelfeuer vor Verdun*)”.<sup>44</sup> Yet was this more than an exceptional case of strained nerves? We also have a 1916 article in the journal of the Bavarian Botanical Society that discussed, with all the earnestness that a German academic can muster, “the death of spruce trees caused by artillery shells”.<sup>45</sup> We should not forget that the brutalization thesis has come under criticism in World War One historiography even for Germany, the country where it was traditionally presumed to have particular plausibility as a contributing factor to the rise of the Nazis.<sup>46</sup>

Of course, there can be little doubt that the First World War slowed the push for environmental reform considerably. I have argued elsewhere that the crisis years from 1914 to

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<sup>42</sup> Landwirtschaftliche Versuchsstation Limburgerhof, *Arbeiten der Landwirtschaftlichen Versuchsstation Limburgerhof: Eine Rückschau auf Entwicklung und Tätigkeit in den Jahre 1914 bis 1939* (Limburgerhof: Landwirtschaftliche Versuchsstation, 1939), pp. 13, 23.

<sup>43</sup> I have discussed this story extensively in my *Die Wahrheit ist auf dem Feld: Eine Wissensgeschichte der deutschen Landwirtschaft* (Göttingen: Vandenhoeck & Ruprecht, 2010), pp. 183-259.

<sup>44</sup> Stadtarchiv Erfurt 1-2/506-382, fol. 28R.

<sup>45</sup> Rubner, "Das durch Artilleriegeschosse verursachte Fichtensterben," *Mitteilungen der Bayerischen Botanischen Gesellschaft zur Erforschung der heimischen Flora* 3:13 (January 1, 1916): 273-276.

<sup>46</sup> Benjamin Ziemann, *Contested Commemorations. Republican War Veterans and Weimar Political Culture* (Cambridge: Cambridge University Press, 2013), p. 268.

1945 may represent “something of a hiatus” in environmental history.<sup>47</sup> But was that due to the general change of the political and socioeconomic context, or can we identify a more immediate connection? For instance, was there an upswing of apocalyptic thinking, or were there specific groups that would be the environmentalist equivalent to Dadaism or the authors of the Lost Generation? Thanks to Edmund Russell’s path-breaking inquiry into *War and Nature*, environmental historians know about how military experiences shaped environmental tools and mindsets.<sup>48</sup>

### **Animals to the Front**

One of the most popular environmental memories of World War One started with a children’s novel. In 1982, Michael Morpurgo wrote *War Horse*, a book that explores wartime suffering through the career of a horse that is drafted for the British army. Twenty-nine years later, Walt Disney Studios released a movie of the same title that was based on Morpurgo’s book; the director was Steven Spielberg. It was nominated for six Oscars, and it gained worldwide returns of \$ 177 million with a production budget of \$ 66 million. According to the website *Box Office Mojo*, which tracks box office revenue, it has dethroned *Lawrence of Arabia* as the highest grossing movie on the First World War.<sup>49</sup>

It is the type of film that has academic historians rolling their eyes. Horses did serve in the First World War, but their fate was usually predestined: “In the summer of 1918, average life expectancy for an artillery horse was ten days.”<sup>50</sup> The equestrian hero of *War Horse* crosses the frontlines twice, and the film has a Hollywood ending: the horse survives and reunites with its pre-war owner. And then it is a matter of debate whether the thick personal drama leaves any room for broader issues. The National Theatre that had the *War Horse* musical on show in London enjoyed critical acclaim: “thrilling” (Sunday Times), “stunning” (Time), “genius” (Daily Telegraph), and “pure theatrical imagination” (Newday). None of which bodes well for historical awareness.

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<sup>47</sup> Frank Uekoetter, “Thinking Big: The Broad Outlines of a Burgeoning Field”, Uekoetter (ed.), *The Turning Points of Environmental History* (Pittsburgh: University of Pittsburgh Press, 2010), pp. 1-12; p. 9.

<sup>48</sup> Edmund Russell, *War and Nature. Fighting Humans and Insects with Chemicals from World War I to Silent Spring* (Cambridge: Cambridge University Press, 2001).

<sup>49</sup> Cf. <http://boxofficemojo.com/movies/?id=warhorse.htm> and <http://boxofficemojo.com/genres/chart/?id=worldwari.htm> (retrieved March 22, 2017).

<sup>50</sup> Gene M. Tempest, “All the Muddy Horses: Giving a Voice to the ‘Dumb Creatures’ of the Western Front (1914-1918),” Rainer Pöppinghege (ed.), *Tiere im Krieg: Von der Antike bis zur Gegenwart* (Paderborn: Schöningh, 2009), pp. 217-234; p. 218.

The commemoration of World War One has always been staunchly anthropocentric, and the room for non-human actors was scant. When Alfred Crosby published a pioneering study of the 1918 influenza, he called it “America’s forgotten pandemic”.<sup>51</sup> When it came to commemoration, animals had the best chance when they succumbed to human categories and qualified as “comrades”. In Germany, veteran cavalry soldiers and animal protection leagues joined forces in the commemoration of war horses and issued thousands of plaques to “equestrian comrades” (*Ehrenschild Kriegskamerad*). However, one can also read this as nostalgia, as the fortunes of the cavalry were obviously in decline.<sup>52</sup> A few British pigeons received the Victoria Cross for honorable wartime service, and monuments for “pigeon-soldiers” were built in Lille and Brussels.<sup>53</sup> The pigeon that carried the last message from the falling Fort Vaux at Verdun is a French national myth.<sup>54</sup>

In 1932, a frieze was unveiled at a clinic of the Royal Society for the Prevention of Cruelty to Animals in northwest London that mentioned the society’s role in tending for 725,216 animals wounded during the Great War.<sup>55</sup> However, veteran soldiers, rather than animal welfare groups, were the driving force behind the commemoration of animals, and that had an important consequence in that memories of animal companionship typically died with the veterans.<sup>56</sup> Technology came to dominate the public view of war, and animals did not quite fit a mental picture with tanks and airplanes. However, the topic reemerged about a decade ago when the Princess Royal unveiled an “Animals in War” memorial near London’s Hyde Park. To the best of this author’s knowledge, no other country has such a high-profile monument to animals in war.<sup>57</sup>

The dedication of the monument took place upon the ninetieth anniversary of World War One in November 2004. It is not a monument that focuses specifically on the Great War, though, as any type of commemorative discrimination would have run counter to the intended goal of honoring a forgotten class of actors. The inscription says that the monument “is

<sup>51</sup> Alfred W. Crosby, *America’s Forgotten Pandemic: The Influenza of 1918* (Cambridge: Cambridge University Press, 1989).

<sup>52</sup> Rainer Pöppinghege, “Abgesattelt! Die publizistischen Rückzugsgefechte der deutschen Kavallerie seit 1918,” Pöppinghege (ed.), *Tiere im Krieg: Von der Antike bis zur Gegenwart* (Paderborn: Schöningh, 2009), pp. 235-250; p. 238.

<sup>53</sup> Rainer Pöppinghege, Tammy Proctor, “‘Außerordentlicher Bedarf für das Feldheer’: Brieftauben im Ersten Weltkrieg,” Pöppinghege (ed.), *Tiere im Krieg: Von der Antike bis zur Gegenwart* (Paderborn: Schöningh, 2009), pp. 103-117; p. 115.

<sup>54</sup> [http://www1.rfi.fr/actu/fr/articles/074/article\\_42106.asp](http://www1.rfi.fr/actu/fr/articles/074/article_42106.asp) (retrieved March 21, 2017).

<sup>55</sup> Hilda Kean, “Animals and War Memorials: Different Approaches to Commemorating the Human-Animal Relationship,” Ryan Hediger (ed.), *Animals and War. Studies of Europe and North America* (Leiden: Brill, 2013), pp. 237-262; p. 248.

<sup>56</sup> For a commemorative anthology of veteran stories, see Johannes Theuerkauff (ed.), *Tiere im Krieg* (Berlin: Steuben-Verlag, 1938).

<sup>57</sup> In May 2009, a much smaller “Animals in War” memorial was unveiled at the Australian War Memorial in Canberra. (Kean, “Animals and War Memorials,” pp. 257-259.)

dedicated to all the animals that served and died alongside British and Allied forces in wars and campaigns throughout time”, and a relief shows many different animals. Two heavily laden bronze mules climb a few steps to get through a small gap in the Portland stone wall, and a horse and a dog are waiting on the other side. In addition to the names of donors and theatres of war, the monument also offers a sobering insight into the role of animals in war: “They had no choice.”<sup>58</sup> But then, it is a matter of debate whether the ordinary conscripted soldier had more of a choice.

### **The Nature of Commemoration**

Of course, such a remark crosses the crucial line that divides the investigation of memories as they evolved from the investigation of memories as they should be. But why should reflections on the nature of commemoration be off-limits for environmental historians, given that commemorative events of 2014 made ample use of the environment as a canvas? Every school in the United Kingdom received a pack of poppy seeds to plant in their school grounds. Prime Minister David Cameron launched the scheme with a planting ceremony at 10 Downing Street that enthusiasts can watch on YouTube (however, the video received only 1,411 views and 16 likes over the following three years).<sup>59</sup> The poppy “had accumulated a ripe traditional symbolism in English writing”, making it a multifaceted bundle of allusions that included homoerotic love by 1914, but it all faded into the background when the poppy became a British symbol of remembrance.<sup>60</sup> It has served as a major fundraising tool of the Royal British Legion since the First World War, and a number of other countries share the poppy with somewhat lesser enthusiasm. The custom goes back to the poem “In Flanders Fields” that John McCrae, a British army surgeon, wrote during the Second Battle of Ypres. First published in the December 8, 1915 issue of *Punch*, the first stanza reads as follows:

In Flanders fields the poppies blow  
Between the crosses, row on row,  
That mark our place; and in the sky  
The lark, still bravely singing, fly  
Scarce heard amid the guns below.<sup>61</sup>

<sup>58</sup> Information on the monument is available at <http://www.animalsinwar.org.uk>.

<sup>59</sup> <http://www.youtube.com/watch?v=LCdmKvKe4AY> (retrieved March 21, 2017).

<sup>60</sup> Paul Fussell, *The Great War and Modern Memory* (London: Oxford University Press, 1975), p. 247.

<sup>61</sup> John McCrae, *In Flanders Fields and Other Poems* (London: Hodder and Stoughton, 1919), p. 15.

The poet captured an authentic experience. Larks did sing in Flanders in the morning, and poppies grew in great numbers on the battlefields. Poppy seeds can stay in the ground for years, they blossom during fallow, and their red color invited the association with spilled blood along with the hope that something more elevating may grow from the killing fields. But poppies flourished not only on the wastelands of World War One. They also grow in Afghanistan, where poppies serve a non-decorative function as a source of opium and heroin. With the foreign military presence on the decline, poppy farming is on the rise on Afghan fields, and the centenary of the Great War saw a new production record with 224,000 hectares under cultivation.<sup>62</sup> The connection could insert a sense of ambivalence into British collective awareness, but that calls for a level of reflexivity that nationalist discourses do not always achieve. The cybersphere exploded with outrage when a poppy-wearing David Cameron visited the Great Hall of the People in Beijing on November 9, 2010, as the Chinese hosts felt that the poppy “evoked painful memories of the Opium War fought between Britain and China from 1839 to 1842.”<sup>63</sup> The learning curve was rather flat on the British side, for Cameron was spotted with another poppy when he received Chinese President Xi Jinping at Chequers in October 2015.<sup>64</sup> It would seem that the British prime minister was not up to the subversive power of environmental commemoration.

### **The Final Blossom?**

By and large, the center of Birmingham is a peaceful place. People go there for shopping during the day and to hang out during the night, and strict anti-gun laws make the prospect of a firefight unlikely. There is certainly no need for trenches of the World War One variety. Yet such a trench existed on Victoria Square in the summer of 2014, the place where the city’s street mall meets the Council House. The trench is fenced off and ostensibly mud-free, and its design seamlessly integrates sand bags and lavish flowerbeds. For those who somehow fail to make the connection, two warplanes hover above with grass-covered wings. According to Birmingham Parks & Nurseries, which designed and created the display, they represent a British Sopwith Camel chasing the Red Baron’s Fokker DR. I. The flower display is arguably

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<sup>62</sup> <http://www.theguardian.com/news/datablog/2014/nov/12/opium-harvest-afghanistan-record-levels-after-troop-withdrawal> (retrieved March 21, 2017).

<sup>63</sup> Julia Lovell, *The Opium War: Drugs, Dreams and the Making of China* (London: Picador, 2012), p. ix.

<sup>64</sup> <http://www.independent.co.uk/news/uk/politics/andy-mcsmiths-diary-why-david-cameron-s-poppies-makes-xi-see-red-a6705026.html> (retrieved March 21, 2017).



one of the more bizarre commemorations of World War One, and surely one of the most biologically diverse. It won an award at the Chelsea Flower Show, and it was rebuilt in 2015.



*World War One Memorial Display in Birmingham, England. Photo by the author.*

The display was part of a national campaign that left little doubt about the sponsors' earnestness, and yet one cannot help but wonder whether, the best efforts of West Midlands gardeners notwithstanding, 2014 saw the last flowering of World War One commemoration. In reviewing the scholarly output upon the ninetieth anniversary ten years ago, the *New Yorker* smelled "the first cool injections of historical embalming fluid". Historians continued to disagree, but their quarrels no longer had the biting vigor of personal involvement. "Something larger is at work now, and that is a tendency to view the war not as the end of everything but as just one more thing that happened."<sup>65</sup> Ten years on, it seems that the Great War is even further along on its way to a final resting place in collective memory.

The last British survivor of the trenches, Harry Patch, died in 2009 at the age of 111.<sup>66</sup> His take on the Birmingham flower display is anyone's guess, though he would probably have been too polite to make comparisons with what he saw at Passchendaele. But then, maybe it is time to see commemorative events as more than an afterlife? We inevitably see the Great War through a mesh of subsequent events nowadays: the rise and fall of communism, perennial conflict in the Middle East, Nazi rule and World War Two, John F. Kennedy reading Barbara Tuchman's *The Guns of August* during the Cuban missile crisis, the spate of Balkan Wars

<sup>65</sup> Adam Gopnik, "The Big One: Historians Rethink the War To End All Wars," *The New Yorker* August 23, 2004, pp. 78-85; p. 78.

<sup>66</sup> <http://news.bbc.co.uk/1/hi/uk/8168691.stm> (retrieved March 21, 2017).



during the 1990s, and, most recently, war in Ukraine. Exorcising these multiple layers of memory is as impossible as ending overgrowth in Verdun. In both cases, we are faced with a dynamism that we cannot escape, notwithstanding emphatic wishes to the contrary. What commemoration depicts as an afterlife is, in reality, life itself.

So maybe the nature of Verdun can teach us a lesson about the dynamism of memory, both natural and other. The monuments that the nations of Europe built during and after the war were meant for eternity, and this line of thinking extends to landscapes of war. As Chris Pearson has written, “Preservers of memory have, at times, employed the natural environment to naturalise and eternalise memories”.<sup>67</sup> However, eternal memory is just as sterile as a landscape without change. The park wardens at Verdun know that preservation is always an act of restoration and that the best we can do is to reflect on overgrowth and our own response. Yet a similar degree of self-reflection in the public at large remains elusive. Even the soil refuses to deliver a touch of eternity, as scientists have shown that “measureable amounts of soil development have occurred within the craters since the 1916 battle of Verdun.”<sup>68</sup> When Harry Patch passed away, Prime Minister Gordon Brown went on record as saying, “The noblest of all the generations has left us, but they will never be forgotten.”<sup>69</sup> It seems that the nature of Verdun knows more about the dynamism of memory than 10 Downing Street.

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<sup>67</sup> Chris Pearson, *Scarred Landscapes: War and Nature in Vichy France* (Basingstoke: Palgrave Macmillan, 2008), p. 141.

<sup>68</sup> Hupy and Schaetzl, "Soil Development," p. 45.

<sup>69</sup> <http://news.bbc.co.uk/1/hi/uk/8168691.stm>.